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REAFFIRMED
2002
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2011
REAFFIRMED
NOV 2007
RE-AFFIRMED 1996

Indian Standard

SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

(First Reprint OCTOBER 1996)

UDC 614.844.1

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

May 1987

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AMENDMENT NO. 4 FEBRUARY 2010
TO
IS 11833 : 1986 SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

(*Page* 9, *clause* **11.1**) — Substitute the following for the existing:

"Each extinguisher body shall be painted either with epoxy powder coating or synthetic enamel paint. The shade shall be 'Fire Red' or 'Post Office Red' conforming to Shades No. 536 or 538 of IS 5.

NOTES

1 Whenever epoxy powder coating is applied on the external surface of mild steel body for anti-corrosive treatment, synthetic enamel paint coating is not required.

2 The body of extinguisher shall be of good finish, clear of all burrs and sharp edges."

(CED 22)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 3 AUGUST 2007
TO
IS 11833 : 1986 SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

(*Page* 5, *clause* 6) — Insert the following new subclause:

'**6.7** Braided rubber/plastic hose shall be having bursting pressure not less than 50 kg/cm^2'.

(CED 22)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 SEPTEMBER 2006
TO
IS 11833 : 1986 SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

[*Page* 10, *clause* **13**, *Title* (*see also Amendment No.* 1)] – Substitute 'ADDITIONAL' *for* 'OPTIONAL'.

(CED 22)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

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(*Continued on page* 2)

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(*Continued from page* 1)

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(*Continued on page* 11)

Indian Standard

SPECIFICATION FOR DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 August 1986, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Dry powder fire extinguishers for metal fires (Class D fires) have special characteristics in view of the fact that these extinguishers are filled with dry powder specially suitable for reactive metals and further in view of the high temperatures involved in burning metals, these extinguishers are able to discharge the contents with low velocity so as to prevent blowing away of the burning metallic particles which can be dangerous, creating the fire elsewhere.

0.3 The extinguisher and components shall be designed taking into account the working pressure required to achieve satisfactory performance under maximum pressure achieved at 60°C ambient temperature or maximum pressure likely to be developed in the system with stoppage of powder flow due to obstruction, whichever is more.

0.4 For the the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements regarding material, shape, construction, chemical charges, anti-corrosive treatment and tests for dry powder fire extinguishers for Class D fires (fires due to burning of metals), of capacities 10, 25, 50, 75 and 100 kg.

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*Rules for rounding off numerical values (*revised*).

2. CAPACITY

2.1 The total capacity of the dry powder extinguisher for metal when filled for the various capacities shall be as under:

Nominal Capacity kg	*Dry Powder Content* kg, *Min*
10	10
50	50
25	25
75	75
100	100

3. PRINCIPLE

3.1 The method of expulsion of dry powder shall be by means of pressure produced from compressed or liquefied gas from gas cylinder or cartridge attached to the body.

4. MATERIALS

4.1 The material for construction of various parts of the fire extinguisher shall be as given in Table 1.

5. SHAPE AND DIMENSIONS

5.1 The shape of the body shall be cylindrical. The dimensions shall be as follows:

Nominal Capacity kg	*Outside Diameter of Body* mm	*Thickness of Shell Material* mm
10	175 $^{+10}_{-5}$	Not less than 2
25 50 75	Not more than 750	Not less than 3·15
100	Not more than 750	Not less than 6

NOTE — The minimum thickness of sheet takes into account the minimum thickness required based on bursting formulae and shall not be less than *d*/100, where *d* is the diameter of body in mm.

5.2 The neck ring shall provide a clear opening of not less than 75 mm (not less than 45 mm in case of 10 kg capacity) and shall have parallel screw threads (*see* **5.3**) for effective length of not less than 25 mm.

5.3 The cap shall be threaded for fixing to the neck ring in the body for not less than 20 mm effective length. The parallel threads shall be in accordance with IS : 554-1975*. At least 3 holes of not less than 3 mm dia each shall be drilled through the threads of the cap to form vents for release of any pressure remaining in the body during withdrawal of the cap. The centres of the vent holes shall be 6·5 mm from the face of the cap joint washer.

5.4 Discharge hose shall be of the following dimensions:

Capacity of Extinguisher	*Diameter*	*Length*
kg	mm	m
10	Not less than 12·5	Not less than 2
25		
50	Not less than 20	Not less than 3
75		Not less than 5
100		Not less than 8

5.5 The wheeled carriage except for 10 kg capacity, shall be as shown in Fig. 1 and the lowest part of the body shall remain not less than 100 mm above ground when in vertical position.

5.6 The drain plug provided shall have an opening of not less than 25 mm diameter except for 10 and 25 kg capacity.

6. CONSTRUCTION (*see* Fig. 1)

6.1 The body shall be designed and constructed according to IS : 2825-1969†.

6.2 The domed ends of the body shall be without reverse of curvature and shall be dished outwards to a radius not exceeding the internal diameter of the body to which these are fixed.

6.3 Non-ferrous metal parts shall be brazed to the body.

6.4 The wheeled carriage shall be either integral with the body or shall be as a separate carriage with proper locking/seating arrangement to the body.

6.5 A towing handle shall be provided on the body for easy manouevrability as per details given in Fig. 1.

6.6 Necessary supporting fixture for hose rest shall be provided on the body.

---

*Dimensions for pipe threads where pressure tight joints are required on the threads (*second revision*).

†Code for unfired pressure vessels.

TABLE 1 MATERIALS OF CONSTRUCTION FOR VARIOUS PARTS OF FIRE EXTINGUISHER

(*Clause* 4.1.2)

SL No. (1)	COMPONENT (2)	MATERIAL (3)	CONFORMING TO (4)
1.	Body	Mild steel plates	IS : 513 - 1973* (for 10 kg capacity only) IS : 2002-1982† IS : 226-1975‡
2.	Neck ring	Mild steel seamless tube	IS : 1239 (Part 1)-1979§
3.	Cap	a) Leaded tin bronze	Grade LTB-2 of IS : 318-1981‖
		b) Extruded brass sections	Type 1 of IS : 319-1974¶
4.	Discharge fittings	a) Leaded tin bronze	Grade LTB-2 of IS : 318-1981‖
		b) Extruded brass sections	Type I of IS : 319-1974¶
5.	Drain plug	a) Leaded tin bronze	Grade LTB-2 of IS : 318-1981‖
		b) Extruded brass sections	Type I of IS : 319-1974¶
		c) MS plates	IS : 226-1975‡
6.	Discharge nozzle	a) Aluminium alloy	IS : 617-1975**
		b) Extruded brass sections	Type I of IS : 319-1974¶
		c) Leaded tin bronze	Grade LTB-2 of IS : 318-1981‖
7.	Applicator	a) Aluminium alloy	IS : 617-1975**
		b) Aluminium tube	IS : 1285-1975††
		c) Extruded brass	Type I of IS : 319-1974¶
		d) Leaded tin bronze	Grade LTB-2 of IS : 318-1981‖
8.	Cap washer	Rubber	IS : 937-1981‡‡
9.	Syphon tube	a) Mild steel tube	IS : 3601-1984§§
		b) Brass	Alloy No. 2 of IS : 407-1981‖‖
10.	Hose	Braided rubber/plastic	Having bursting pressure not less than 50 kgf/cm²

11.	Expellent gas cylinder	a) Cartridge b) Manganese steel cylinder	IS : 4947-1985¶¶ IS : 7285-1982***
12.	Expellent cylinder discharge valve	—	IS : 3224-1979†††
13.	Wheeled carriage	Details given in Fig. 1	

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*Specification for cold rolled carbon steel sheets (*second revision*).

†Specification for steel plates for pressure vessels for intermediate and high temperature service including boilers (*first revision*).

‡Specification for structural steel (standard quality) (*fifth revision*).

§Specification for mild steel tubes, tubulars and other wrought steel fittings: Part 1 Mild steel tubes (*fourth revision*).

‖Specification for leaded tin bronze ingots and castings (*second revision*).

¶Specification for free-cutting brass bars, rods and sections (*third revision*).

**Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

††Specification for wrought aluminium and aluminium alloy, extruded round tube and hollow sections (for general engineering purposes) (*second revision*).

‡‡Specification for washers for water fittings for fire fighting purposes (*second revision*).

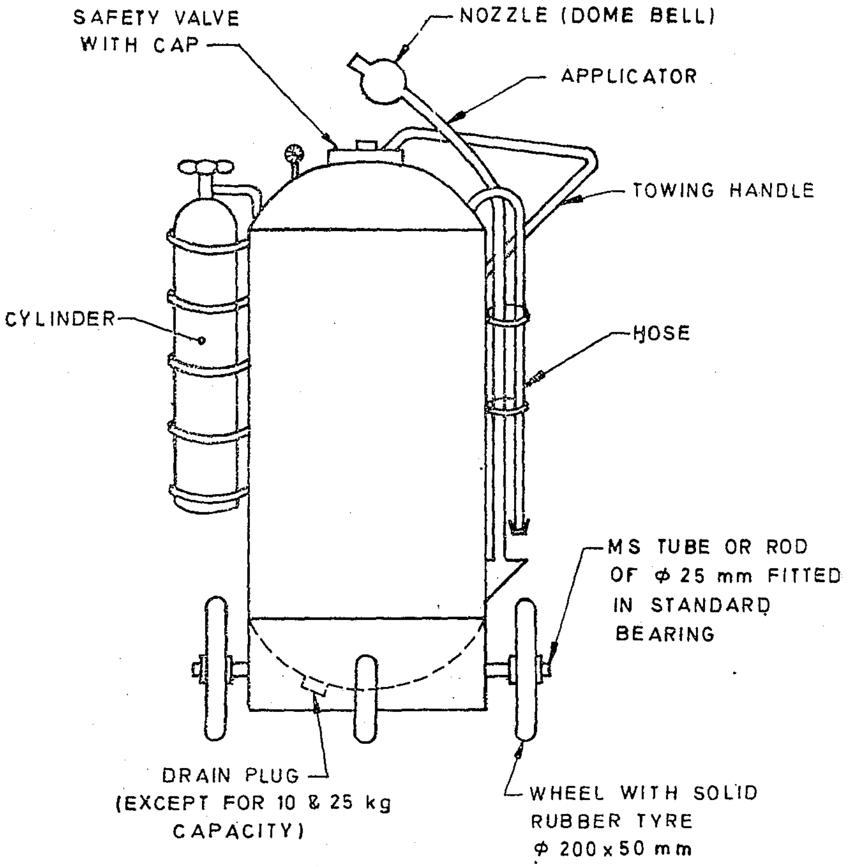
§§Specification for steel tubes for mechanical and general engineering purposes (*first revision*).

‖‖Specification for brass tubes for general purposes (*third revision*).

¶¶Specification for gas cartridge for use in fire extinguishers (*second revision*).

***Specification for seamless manganese steel cylinders for permanent and high pressure liquefiable gases (*first revision*).

†††Specification for valve fittings for compressed gas cylinders excluding liquefied petroleum gas (LPG) cylinders (*second revision*).


SAFETY VALVE WITH CAP
NOZZLE (DOME BELL)
APPLICATOR
TOWING HANDLE
CYLINDER
HOSE
MS TUBE OR ROD OF ϕ 25 mm FITTED IN STANDARD BEARING
DRAIN PLUG (EXCEPT FOR 10 & 25 kg CAPACITY)
WHEEL WITH SOLID RUBBER TYRE ϕ 200 x 50 mm

NOTE 1 — For 25 kg and lesser capacity, gas cartridge on outside or inside may be used.

NOTE 2 — For 10 kg capacity, trolley is not needed.

FIG. 1 TYPICAL DETAILS OF DRY POWDER FIRE EXTINGUISHER FOR METAL FIRES

7. EXPANSION SPACE

7.1 A space shall be provided above dry powder level in the body of the extinguisher. It shall be of sufficient volume to ensure that when discharge nozzle is temporarily closed and the extinguisher is operated at a temperature of 27 ± 2°C, the internal pressure shall not exceed 1·5 MN/m^2 (15 kgf/cm^2) and the body shall not show any sign of leakage.

8. APPLICATOR

8.1 The applicator shall be fitted to the discharge end of the hose by a coupling. The applicator shall consist of an extended pipe, not less than 1 m long, with a dome bell at its end and provided with deflecting vanes so as to sprinkle the powder on the burning reactive metal surface, as a low pressure discharge, to give the performance characteristics stipulated in **12.1**.

9. ANTICORROSIVE TREATMENT

9.1 All internal surfaces of the body and other internal parts shall be completely coated with zinc or lead-tin in alloy (tin not less than 10 percent) either by hot dipping process or by electrodeposition process or by phosphating, to a thickness of not less than 0·025 mm. The thickness of the coating shall be measured as per IS : 3203-1982*.

10. DRY POWDER CHARGE

10.1 The dry powder used shall conform to IS : 4861-1984†.

11. PAINTING

11.1 Each extinguisher shall be painted fire red conforming to shade No. 536 of IS : 5-1978‡. All components of trolley and other items other than the fire extinguisher shall be painted with the primer and finishing paints of two coats each.

12. TEST REQUIREMENTS

12.1 The extinguisher when operated with the applicator, at a temperature of 27 ± 2°C in still weather condition shall be capable of discharging minimum of 85 percent by mass of the actual rated capacity.

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*Methods of testing local thickness of electroplated coatings (*first revision*).

†Specification for dry powder for fighting fires in burning metals (*first revision*).

‡Colours for ready mixed paints and enamels (*third revision*).

The contents shall be expelled in the form of steady stream low pressure discharge which shall comply with the following requirements:

Capacity of Extinguisher, kg	*Duration, Seconds*
10	20 to 30
25	30 ,, 40
50	40 ,, 50
75	50 ,, 60
100	70 ,, 80

12.2 The extinguisher shall be tested to an internal hydraulic pressure of 3 MN/m^2 (30 kgf/cm^2) for a period of 5 minutes. During test, it shall not show any sign of leakage. In case of hydraulic burst the mechanical failure shall not occur below 4·5 MN/m^2 (45 kgf/cm^2).

13. MARKING

13.1 Each extinguisher shall be clearly and permanently marked with the following information:

a) Name of the manufacturer or trade-mark, if any;
b) Method of operation in prominent letters;
c) The words 'DRY POWDER EXTINGUISHER FOR METAL FIRE';
d) The capacity of the extinguisher in kg;
e) The words 'RECHARGE AFTER USE';
f) A declaration to the effect that the body of the extinguisher has been tested to a pressure of 3·0 MN/m^2 (30 kgf/cm^2);
g) Letter 'D' indicating the suitability for 'Class D' fires;
h) Year of manufacture; and
j) Working and design pressure.

13.1.1 The extinguisher may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

(*Continued from page* 2)

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